REMARKS

In view of the above amendments and following remarks, reconsideration of the outstanding office action is respectfully requested. Pursuant to 37 CFR § 1.121, attached as Appendix A is a Version with Markings to Show Changes Made.

The rejection of claims 32 and 33 under 35 U.S.C. § 112 (1st para.) for failure to satisfy the written description requirement is respectfully traversed in view of the cancellation of these claims.

The rejection of claims 27, 32, and 33 under 35 U.S.C. § 112 (1st para.) for lack of enablement is respectfully traversed in view of the cancellation of claims 32 and 33 and the following remarks concerning claim 27.

With respect to claim 27, the U.S. Patent and Trademark Office ("USPTO") has asserted that the specification does not teach which genes can be expressed in a transgenic plant using a *SHORT-ROOT* promoter to reduce a plant's susceptibility to lodging. In view of the amendments to claims 27, applicants disagree. Claim 27 has been amended to recite the gene of interest as being a *SHORT-ROOT* gene that is overexpressed in the plant under conditions effective to cause the plant to be less susceptible to lodging than a wild-type plant. Support in the specification for this amendment is found at page 12, line 34 to page 13, line 7, page 48, line 29 to page 49, line 5. In particular, the specification states that "[s]ince SHR affects gravitropism of aerial structures, overexpression of *SHR* may be used to develop 'straighter' transgenic plants that are less susceptible to lodging" (page 13, lines 5-7). Further, specific enabling disclosure of the use of a *SHORT-ROOT* promoter to overexpress a *SHORT-ROOT* gene in transgenic plants is found at page 48, line 29 to page 49, line 5.

The rejection of claim 27 for lack of enablement is therefore improper and should be withdrawn.

The rejection of claims 22-25 and 31-33 under 35 U.S.C. § 112 (2nd para.) for indefiniteness is respectfully traversed in view of the cancellation of claims 32 and 33 and the following remarks with regard to claims 22-25 and 31.

The USPTO has taken the view that the recitation of the phrase "said promoter consisting essentially of" is indefinite. Specifically, the USPTO believes that the use of this transitional phrase makes the rejected claims indefinite, because it is unclear what would materially affect the promoter function of the nucleic acid sequence of SEQ ID NO:4. Applicants respectfully disagree. The meaning of the transitional phrase "consisting essentially of" is well known in patent law. In particular, this phrase limits the scope of a claim to the specific materials or steps recited in the claim, as well as to "those that do not materially affect the basic and novel characteristic(s)" of the claimed invention. In re Herz,

537 F.2d 549, 551-552, 190 U.S.P.Q. 461, 463 (CCPA 1976) (citing In re Janakirama-Rao, 317 F.2d 951, 951-953, 137 U.S.P.Q. 893, 894 (CCPA 1963)); Manual for Patent Examining Procedure ("MPEP") § 2111.03. The U.S. Court of Appeals for the Federal Circuit has stated that the "consisting essentially of" transition phrase is "commonly used to signal a partially open claim in a patent." PPG Industries v. Guardian Industries Corp., 156 F.3d 1351, 1354, 48 U.S.P.Q.2d 1351, 1353 (Fed. Cir. 1998). Thus, claims including this transitional phrase are generally accepted as occupying a "middle ground between closed claims that are written in a 'consisting of' format and fully open claims that are drafted in a 'comprising' format." Id.; MPEP § 2111.03.

Generally, a promoter is defined as "[t]he region containing any specific DNA sequences that are essential for the initiation of transcription of RNA from DNA. They are located before structural genes and act as binding sites or facilitators of binding for RNA polymerase, although they are not themselves transcribed." Rudin, Dictionary of Modern Biology, Hauppauge, New York: Barron's Educational Series, Inc., page 304 (1997). Thus, because of the intimate link between a promoter's sequence and function, the ability of a nucleotide sequence to function as a promoter is tied to its ability to serve as a binding site for specific regulatory actors (e.g., RNA polymerases) in a specific molecular process of the cell. Thus, non-trivial changes to a nucleotide sequence of a promoter would certainly inhibit normal promoter function. With respect to each of the rejected claims, the "consisting essentially of" transitional phrase relates to the nucleotide sequence of the *SHORT-ROOT* promoter (i.e., SEQ ID NO:4). Further, each of the rejected claims includes a functional limitation for the *SHORT-ROOT* promoter. Thus, it is clear that a synthetic nucleic acid molecule would not be covered by the promoter claims of the present invention, if such synthetic nucleic acid molecule was produced by making non-trivial changes to the nucleotide sequence of a promoter recited in claims 22-25 and 31, assuming the changes result in a synthetic nucleic acid molecule that does not function to promote stele-specific expression in plants.

Since "consisting essentially of" has a well-established meaning and the function and structure of the claimed promoter is fully described in the present application, one of ordinary skill in the art would fully understand the meaning of claims 22-25 and 31. Accordingly, the rejection of claims 22-25 and 31 for indefiniteness is improper and should be withdrawn.

The rejection of claims 31-33 under 35 U.S.C. § 102(b) as anticipated by Bevan et al., GenBank Accession No. AL035605 (1999) ("Bevan") is respectfully traversed

in view of the cancellation of claims 32 and 33 and the following remarks with regard to claim 31.

Bevan discloses the DNA sequence of the *Arabidopsis thaliana* DNA chromosome 4, BAC clone F19F18. The DNA sequence disclosed in Bevan has a total length of 91,740 base pairs. As listed below, Bevan identifies 21 putative proteins, including their corresponding DNA coding and non-coding regions, and, in some cases, their suspected function or similarity to various known proteins. In particular, Bevan delineates the following regions of chromosome 4 of *A. thaliana* as being genes encoding putative protein products with particular characteristics (as shown in parentheses): bases 2,053-3,409 (peroxidase, prxr2); bases 5,135-6,431 (peroxidase-like protein); bases 9,998-10,858 (putative protein); bases 14,033-16,078 (formamidase-like protein); bases 16,838-18,806 (formamidase-like protein); bases 25,522-26,906 (putative protein); bases 29,281-30,913 (probable N-acetyltransferase hookless 1); bases 33,429-35,530 (putative protein); bases 40,174-40,778 (hypothetical protein); bases 40,955-42,332 (putative protein, with similarity to SPOP of *Homo sapiens*); bases 44,540-44,938 (putative protein); bases 49,846-51,137 (putative protein, with similarity to cyclin delta-1 of *A. thaliana*); bases 53,574-57,157 (plasma membrane-type calcium ATPase (ACA2)); bases 62,220-63,815 (putative protein, with similarity to lateral suppressor protein of *Lycopersicon esculentum*); bases 65,892-66,395 (ribosomal-like protein); bases 66,821-69,185 (putative protein, with similarity to amino acid N-acetyltransferase of *Escherichia coli*); bases 71,580-72,917 (putative protein); bases 78,652-79,950 (putative protein); bases 80,736-81,182 (hypothetical protein); bases 88,583-88,954 (putative protein); and bases 89,310-89,667 (putative protein). In addition, Bevan describes bases 28,683-28,820 as a tRNA-Trp and bases 82,499-87,322 as an LTR retrotransposon-like element.

In order to qualify as prior art, a publication (or reference) must contain an enabling disclosure of the invention at issue. In re Hoeksema, 399 F.2d 269, 273, 158 U.S.P.Q. 596, 600 (CCPA 1968). This means that the publication must "sufficiently describe the claimed invention to have placed the public in possession" of the invention at issue. In re Donohue, 766 F.2d 531, 533, 226 U.S.P.Q. 619, 621 (Fed. Cir. 1985). Possession of an invention is demonstrated "if one of ordinary skill in the art could have combined the publication's description of the invention with his own knowledge to make the claimed invention." Id. (citing In re LeGrice, 301 F.2d 929, 939, 133 U.S.P.Q. 365, 373-374 (CCPA 1962)). Thus, even if the invention at issue "is disclosed in a printed publication, that disclosure will not suffice as prior art if it was not enabling." Donohue, 766 F.2d at 533, 226 U.S.P.Q. at 621 (citing In re Borst, 345 F.2d 851, 855, 145 U.S.P.Q. 554, 557 (CCPA 1965)).

SEQ ID NO:4 of the present invention is located within the DNA sequence of Bevan, starting at position 59,720 and ending at position 62,222. Bevan does not identify these starting and ending positions. Further, nowhere does Bevan single out the sequence corresponding to SEQ ID NO:4 as having any particular function, let alone a promoter function. In contrast, as described below, Bevan specifically identifies (by nucleotide starting and ending bases) numerous other genes of the *A. thaliana* chromosome 4 , including many of the known or putative functions of these genes. Since this reference fails to identify the function of this nucleotide sequence and its functional bands, it cannot satisfy the "how to use" aspect of the enablement requirement. Due to the above deficiencies of Bevan, applicants respectfully submit that the rejection of claim 31 under 35 U.S.C. § 102(b) based on Bevan is improper and should be withdrawn.

In view of the foregoing, applicants submit that this case is in condition for allowance and such allowance is earnestly solicited.

Respectfully submitted,

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May 27, 2003 JoAnn Whalen
Date JoAnn Whalen

APPENDIX A
Version With Markings to Show Changes Made
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In reference to the amendments made herein to claims 22, 24, 27, and 31, additions appear as underlined text, while deletions appear as bracketed text, as indicated below:

In the Claims:

22. (Twice Amended) A transgenic plant comprising a transgene encoding a heterologous gene of interest operatively associated with a *SHORT-ROOT* promoter, said promoter consisting essentially of a nucleic acid sequence of SEQ ID NO:4 and functioning to promote stele-specific expression in roots and embryos of a plant, so that the gene of interest is expressed in a tissue-specific manner in roots or embryos.

24. (Twice Amended) A transgenic plant comprising a transgene encoding a heterologous gene of interest operatively associated with a *SHORT-ROOT* promoter, said promoter consisting essentially of a nucleic acid sequence of SEQ ID NO:4 and functioning to promote stele-specific expression in shoots of a plant, so that the gene of interest is expressed in shoots.

27. (Amended) The plant of Claim 25, wherein said gene of interest is a *SHORT-ROOT* gene that is overexpressed in said plant under conditions effective to cause said plant to be [which is] less susceptible to lodging than a wild-type plant.

31. (Twice Amended) An isolated nucleic acid molecule consisting essentially of a nucleic acid sequence of SEQ ID NO:4, wherein said nucleic acid molecule functions to promote stele-specific expression in roots and shoots of a plant.